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"NATURÆ SPECIES RATIOQUE."

Introduction

— to —

The Fauna of the Midland Plateau

By P. E. MARTINEAU.

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The Fauna of the Midland Plateau.

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INTRODUCTION.

IN compiling a local Fauna or Flora it is not enough barely to record the occurrence of a species; a parochial list has no scientific value. The justification of such a work is that it can give the minutest details concerning the limited area which it covers. It can distinguish the stray immigrant from the shyest regular inhabitant, and, by making its analysis quantitative, can deal effectively with the utmost niceties of geographical distribution.

Horizontal range is not all that is meant by geographical distribution. Within its actual range the number of individuals of a species varies widely from place to place, and the facts of that variation, as well as its causes, such as climate, aspect, and the nature of the ground, must all be considered. Vertical range, again, is quite as important as horizontal, though, except in mountain regions, it has hitherto received scant attention. It may be said that, for a limited area, climate depends almost entirely on elevation, and so vertical range is really the more important of the two, and that if the range of a species be recorded mile by mile horizontally, it should also be recorded vertically foot by foot. Properly contoured maps are so new a thing that their full usefulness to naturalists is only beginning to be grasped; but where the detailed mapping of a Flora has been undertaken, the ecological zones, even in a country of comparatively low relief, show a marked agreement with the contour-lines. To what extent a Fauna will fall into similar narrow zones is not quite certain, but the vertical range of species seems worthy of the closest study. At the same time the geology, both solid and superficial, is always of the utmost importance, for while the former is the base, so to speak, from which nature

has calculated the horizontal and vertical scales of the country, the latter interferes as directly with the distribution of animals as with that of plants.

There are three ways in which a district can be selected for close study. It may be a political unit, or a circle with the observer's headquarters for its centre, or, again, it may be physically distinguishable from the surrounding country.

The first of these methods is hopelessly unscientific. A Fauna and a Flora refuse to array themselves as a *posse comitatus*, they cannot be registered by electoral divisions, and parish boundaries they absolutely ignore. In some cases arrangement by counties may be convenient, but for Warwickshire it is particularly unsuitable, in that Birmingham, obviously the most convenient working-centre in the Midlands, lies in its extreme corner, and pushes out its suburbs rather into Worcestershire and Staffordshire than into the county to which it belongs. Moreover, though Arden, or North-west Warwickshire, is physically indistinguishable from the parts of Staffordshire and Worcestershire which adjoin it, Feldon, which is Warwickshire, East of Avon, is a Lias country, entirely distinct from Arden geographically no less than geologically, and supporting a different Fauna and Flora.

If, on the other hand, the three shires be all taken together, so that observations may be extended in all directions from Birmingham, not only does the area become inconveniently large for detailed study, but the geological, geographical and climatic contrasts are intensified. A district which includes Edgehill and Malvern and reaches to the desolate moors of Axe Edge calls at once for subdivision if any definite scientific result is to be gained from its examination. The contrast between these distant places in climate, to say nothing of geological differences, is so considerable, that the facies of life exhibited by them can only be a little less varied than that of all South Britain.

The second method suggested transgresses even political boundaries, some of which, at any rate, had their origin in natural lines of division. It may in some cases be a convenient plan, but in the

Midlands argument for or against it is of little moment, as there actually exists a definite natural area, geographically distinguishable from the surrounding country, and coinciding pretty nearly with a circle, or at any rate with an ellipse, drawn round Birmingham at a distance of from 15 to 24 miles.

As a district suitable for detailed study by naturalists Professor Lapworth long ago suggested the Midland Plateau, and as a working boundary for the Plateau he indicated the contour-line marking 300 feet above sea-level. A line has therefore been drawn, enclosing the 300 feet contour-line and generalised from it, and it is proposed to refer to it as *Lapworth's Line*, though it diverges at a few points from the course originally laid down for it. These slight divergences were made at the instance of the Geographical Section of the Birmingham Natural History and Philosophical Society, a sub-committee of which Section was entrusted with the preparation of a map of the Plateau,* and the map, with these slight variations from the original plan, has been approved by Professor Lapworth.

The Midland Plateau, as defined by Lapworth's Line, is, roughly, an ellipse, measuring 46 miles from N.N.W. to S.S.E. by 34 miles from E.N.E. to W.S.W. The former of these measurements may be reckoned from Gnosall, near Newport (Salop), to Welcombe, close to Stratford-on-Avon, and the latter from Nuneaton to the Southern end of Kinver Edge. The ellipse is nearly 130 miles in circuit, following the bold curves of Lapworth's Line, and its area is almost exactly 1,000 square miles.

For a total distance of about 100 miles out of this 130 the edge of the Plateau is a steep escarpment and a very prominent feature in the landscape: a feature that cannot possibly be missed, even if its real significance be not perceived. At four points this escarpment is interrupted; the rivers Tame, Alne, Arrow and Stour having excavated wide and deep valleys, which penetrate some distance into the interior of the Plateau, without, however, destroying its continuity. Across

*NOTE.—A map of the Midland Plateau, scale 2 miles to the inch, coloured in contours, has been prepared, and can be had on application to the General Secretary of the Society. Price 1/- on paper, not folded.

the openings of these valleys the Plateau boundary has been indicated by a broken line, to show that it does not there conform to the 300 feet contour-line. Again, at three other points, a similar broken line is drawn across certain narrow necks of land, which rise very slightly above the 300 feet line, and, by joining the Plateau to other stretches of high ground, make it possible to trace a single main water-parting from one end of England to the other. The isthmus on the East, at Bedworth, joins the Plateau to the high land about the head of Avon, while that on the West, which may be called the Watling Street isthmus, unites it with the Wrekin mass, and so with the mountain country of Shropshire and Wales. The third, the Gnosall isthmus on the North-west, is connected with the high ground between Staffordshire and Cheshire, and communicates with the mountain-system of North England. These seven arbitrary parts of the boundary-line only measure 28 miles in all.

It is not pretended that the area thus marked off is a kind of island, whose shore is the 300 feet contour-line, or that it harbours a Fauna different from that of the Midlands at large. But it is of a size and shape convenient for examination, and it rises from the surrounding valleys abruptly enough to be easily distinguishable, both on the map and in the field. Its climate also, being distinctly colder than that of the low country, and its vegetation being, in consequence, much later, there is room for a certain difference in habits, if not in species, between its Fauna and that immediately beyond its border.

Upon the whole the Plateau is highest round its margin, and its main system of drainage is internal. There is a marked difference between the slow inward-flowing rivers of the Tame system which converge upon Coleshill from all directions, draining fully half of the Plateau, and the short marginal streams which fall rapidly outwards to the surrounding valleys. The Doley Brook at Gnosall and the Philley Brook, North of Enville, are the only streams flowing inwards across the boundary line.

The Plateau is a Triassic country, and, except the Glacial Drift, which masks so much of the solid geology of the North Midlands, the only later formation visible is the Lias, or rather Rhaetic, small

outliers of which occur in the South and South-east. The surrounding valleys are also Triassic, but while they have been rapidly excavated in soft marls, the Plateau, which consists largely of the same marls, is set, as it were, in a raised frame of hard, resistant rocks, and has in consequence withstood dissection except at one or two vulnerable points. Of this rock-frame the most important member is the Bunter Pebble-bed, which fences the North and West sides, while in certain other parts the Keuper Sandstone, or Waterstones, takes its place.

It is, in fact, the absence of these hard beds that has allowed the four rivers named above to cut such considerable valleys through the Plateau-rim, while their presence has prevented the river Penk from following this example to the full. It is, again, their repetition, and especially that of the Pebble-bed, by a series of faults, that has made the Western part of the district a succession of ridges rather than a regular plateau; so that, the ridges having been reduced by denudation to rows of more or less isolated hills, the country looks confused and broken, and the Plateau-boundary is difficult to fix satisfactorily. It has not been found possible, for instance, to include the Pebble-bed escarpment at Sherriff Hales, West of the Watling Street isthmus, for, though geologically a part of the Plateau-rim, it hangs upon the shoulder of the Wrekin mass and seems geographically inseparable from the Shropshire Hills.

Within the Plateau-border the continuity of the Trias is broken by two large oval patches of older rocks, Palaeozoic islands projecting through the sandstones and marls. Each of these patches is a dome-like uplift with its longer axis running nearly North and South; each displays the Coal-measures within a frame or border of so-called Permian; and each is crossed diagonally, from South-east to North-west, by another uplift of much older rocks.

There, however, the likeness between them ends. The Western dome, which includes the Black Country, has the greater part of its diagonal axis sheathed in Silurian rocks, the Cambrian and Archaean formations only appearing in the Liekey Hills, and shows a wide expanse of Coal-measures within a broken and comparatively narrow Permian border, while the East Warwickshire dome is chiefly

Permian ; with a small inner area of Coal-measures resting directly on the upturned Cambrian. The Western dome, again, is well within the Plateau, of which its diagonal axis forms the main water-parting, and only contributes indirectly to the defence of the frontier, while a great fault runs right along the diagonal axis of the other dome, letting down its outer half clean out of sight. The hard quartzite and volcanic ash of its core are thus exposed, as may be seen in the Nuneaton and Hartshill quarries, and for some seven miles form an escarpment which guards the Eastern side of the Plateau even more effectively than the Pebble-bed defends it on the West.

The complicated distribution of the rocks of the Plateau can only be shown by a geological map, but it may be said roughly that the Black Country and the Eastern half of the Plateau are floored with Clays or Marls, and the Western half with Sandstones, while the Pebble-bed caps a few hills South and East of the Black Country, and most of those to the West, spreading out Northward to cover all Cannock Chase and a wide area near Sutton Coldfield. Other formations make a smaller show. Limestone appears at Dudley, Sedgley and Walsall. Basalt caps the Rowley Hills and is seen at Wednesfield and elsewhere, while the exposures of quartzite have been mentioned above. Besides these the curious Breccia of Clent rises more than 1,000 feet above the sea and offers both in material and form a sort of model of a mountain region.

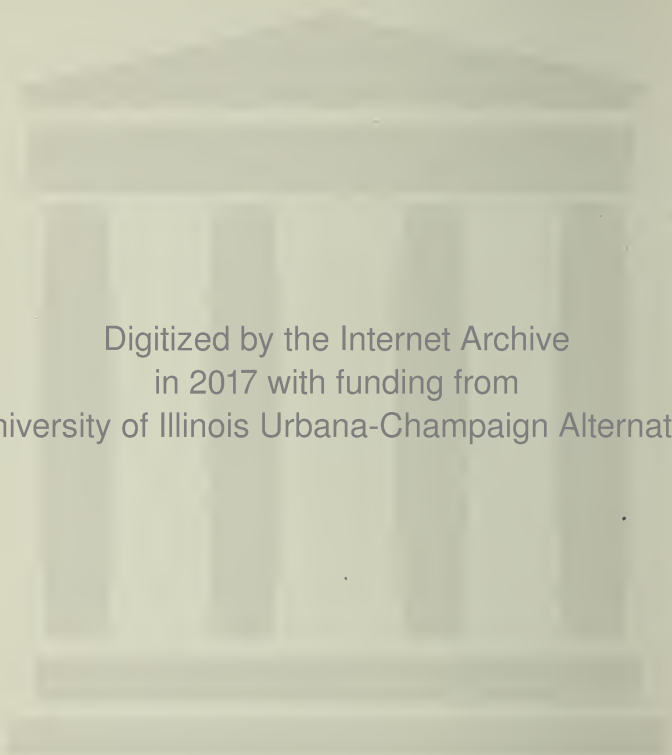
Practically the whole of the Plateau is covered with Glacial Drift of one kind or another, and the fitness of any part of it for the support of plant or animal, for cultivation or habitation, depends as much upon the nature of the drift as upon that of the underlying rocks.

Roughly speaking, the line of the river Rea may be taken as dividing the sand and gravel on the East from the boulder-clay and erratic block district on the West. Sand and gravel are to be found in the Western district, and boulder-clay transgresses slightly to the Eastward, but the Rea makes a fairly satisfactory dividing line, and the broad fact remains that the drift deposits become less and less coherent as they pass East and South.

In this connection it may be pointed out that while Birmingham and many other Plateau towns are placed, as has been well shown by Professor Lapworth, along the outcrop of the Keuper Sandstone, or Waterstones, and derived their original water supply from that formation, the villages and isolated farms of the level clay or marl country are mostly situated on thick pads of gravel drift, which fill up hollows in the old surface.

These ancient settlements derive their water supply from surface wells sunk in the drift, and the size of the villages was, till quite lately, regulated by the thickness of the drift pad, and the capacity of the hollow filled by it. Most of the streams have cut down through the drift into the underlying rock, and have paved their valleys with grey river drift easily distinguishable from the redder glacial gravels.

Every village, and practically any farm of any great age, seems to have been originally built near the edge of such a gravel pad, the land on one side having been cultivated for perhaps 1,000 years, while the gravel remained heath or common perhaps till the end of the 18th century. This historical fact, which is plainly written upon the face of most of Arden, will probably be found to have had a great influence upon the animal life, and especially the insect life, of the district.



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